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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,251	12/01/2003	William Steven Lanier	GENE0116	1612

7590

07/12/2004

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EXAMINER

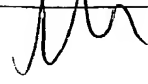
RINEHART, KENNETH

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/724,251	Applicant(s) LANIER ET AL. 	
	Examiner Kenneth B Rinehart	Art Unit 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 26-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 is/are allowed.
- 6) ☒ Claim(s) 1-17, 27 and 29-41 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/1/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 29-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 29-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 29-34 refer to unlimited air which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 31-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 31-34 refer to filtering which was not described in the specification in such a

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way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 32 and 33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 32 refers to 2500 to 2000 which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 33 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 33 refers to 8 to 14 % which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 34 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 34 refers to 20 to 30 % which was not described in the specification in such a way as to

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reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 35-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 35 refers to recovering the mercury from the fly ash which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The disclosure refers to another process where mercury released from the fly ash carbon is absorbed by activated carbon as the ash burnout products pass through mercury collection unit 24. Mercury is not recovered form the fly ash, but from the ash burnout product after it passes through a mercury collection unit. Claim 36 refers to increasing the percentage of enhanced carbon by combusting a feed fuel to provide said increased percentage which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 38 refers to (LOI) from 5 to 15 % which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 39 refers to identifying a fuel which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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Claim 40 refers to selecting a fuel which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 41 refers to 0 to 90 percent and 0 to 15 percent which was not described the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 13-17, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibb et al.

Gibb et al shows selecting a factor to control a combustion process to generate a flue gas comprising fly ash with enhanced in situ-formed unburned carbon wherein the factor is selected from the group consisting of reburning fuel, flue gas temperature, OFA injection, coal particle size, LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone and fuel/air mixing in a secondary combustion zone (page 371, lines 1-3), controlling the combustion process according to the factor to produce the flue gas comprising fly ash with enhanced unburned carbon and to vaporize mercury (page 373, lines 16-20); and allowing the flue gas to cool to collect fly ash with enhanced unburned carbon with absorbed mercury (page 376, line 15, beginning with "(3) Hg"), controlling the combustion process to produce a fly ash containing about 1 to about 30 weight percent carbon (Table 2),

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controlling the combustion process to produce a fly ash containing 3 to 20 weight percent carbon (Table 2), controlling the combustion process to produce a fly ash containing 5 to 15 weight percent carbon (Table 2), allowing the flue gas to cool to a temperature below 450 degrees F, allowing the flue gas to cool to a temperature below 400 F, allowing the flue gas to cool to a temperature below 350 F (page 372, line 10), the flue gas is generated from combustion of solid fuel, the flue gas is generated from combustion of a solid fuel selected from coal, biomass, waste product and combinations thereof selecting a factor from the group consisting of amount of reburning fuel, flue gas temperature and OFA injection (Abstract, page 375, line 6), selecting a factor from the group consisting of coal type and particle size (page 367, lines 10-12), selecting a factor from the group consisting of LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone or fuel/air mixing in a secondary combustion zone (page 367, line 13), conducted without activated carbon injection (see entire document).

Claims 1, 5-7 is rejected under 35 U.S.C. 102(b) as being anticipated by Knowles.

Knowles shows selecting a factor to control a combustion process to generate a flue gas comprising fly ash with enhanced in situ-formed unburned carbon wherein the factor is selected from the group consisting of reburning fuel, flue gas temperature, OFA injection, coal particle size, LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone and fuel/air mixing in a secondary combustion zone), controlling the combustion process according to the factor to produce the flue gas comprising fly ash with enhanced unburned carbon and to vaporize mercury (fig. 1, col. 7, lines 8-11); and allowing the flue gas to cool to collect fly ash with enhanced unburned carbon with absorbed mercury (11, 10,

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fig. 1), allowing the flue gas to cool to a temperature below 450 degrees F, allowing the flue gas to cool to a temperature below 400 F, allowing the flue gas to cool to a temperature below 350 F (col. 7, lines 10-11).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibb et al. Gibb et al discloses selecting a factor to control a combustion process to generate a flue gas comprising fly ash with enhanced in situ-formed unburned carbon wherein the factor is selected from the group consisting of reburning fuel, flue gas temperature, OFA injection, coal particle size, LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone and fuel/air mixing in a secondary combustion zone (page 371, lines 1-3), controlling the combustion process according to the factor to produce the flue gas comprising fly ash with enhanced unburned carbon and to vaporize mercury (page 373, lines 16-20) ; and allowing the flue gas to cool to collect fly ash with enhanced unburned carbon with absorbed mercury (page 376, line 15, beginning with "(3) Hg"). Gibb et al does not disclose removing NOX from the flue gas, wherein the process to remove Nox from the flue gas comprises forming fuel-lean and fuel-rich zones by a fuel staging process or an air staging process, removing Nox from the flue gas, removing Nox from the flue gas by a low Nox combustion technology, removing Nox from the flue gas by a technology selected from low Nox

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burning, reburning, air staging, fuel-lean reburning and overfire air injection, removing Nox from the flue gas by forming a fuel-lean zone and a fuel-rich zone by injection of solid fuel into a post combustion zone. An individual of ordinary skill in the art is aware that Low NOX burners (page 368, line 4) encompass a wide variety of processes and apparatus including removing NOX from the flue gas, wherein the process to remove Nox from the flue gas comprises forming fuel-lean and fuel-rich zones by a fuel staging process or an air staging process, removing Nox from the flue gas, removing Nox from the flue gas by a low Nox combustion technology, removing Nox from the flue gas by a technology selected from low Nox burning, reburning, air staging, fuel-lean reburning and overfire air injection, removing Nox from the flue gas by forming a fuel-lean zone and a fuel-rich zone by injection of solid fuel into a post combustion zone. Therefore it would have been obvious to one of ordinary skill in the art to include removing NOX from the flue gas, wherein the process to remove Nox from the flue gas comprises forming fuel-lean and fuel-rich zones by a fuel staging process or an air staging process, removing Nox from the flue gas, removing Nox from the flue gas by a low Nox combustion technology, removing Nox from the flue gas by a technology selected from low Nox burning, reburning, air staging, fuel-lean reburning and overfire air injection, removing Nox from the flue gas by forming a fuel-lean zone and a fuel-rich zone by injection of solid fuel into a post combustion zone because applicant has not disclosed that the type of low NOX burner provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the low NOX burner of Gibb et al or the claimed burner because both perform the same function of reducing NOX emissions equally well.

Allowable Subject Matter

Claim 28 is allowed.

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to mercury in general: Teller (6439138), Lissianski (6280695), Pennline (6521021), Bhat et al (5672323), Bachik (5868084).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth B Rinehart whose telephone number is 703-308-1722. The examiner can normally be reached on 7:30 -4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached on 703-308-1935. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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KBR


KENNETH RINEHART
PRIMARY EXAMINER